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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Gilbert M. Aust et al.
Serial No. : 09/707,445
Filing Date : November 6, 2000
For : SURGICAL INSTRUMENT
Group Art Unit : 3731
Examiner : Michael H. Thaler
Attorney Docket No. : A31-2047RE

Assistant Commissioner for Patents
Washington, D.C. 20231

RESPONSE

Sir:

In response to the Office Action dated May 21, 2002,
please reconsider the above-identified application in view of
the following remarks.

It is respectfully submitted that claims 1-7 and 10-11
are allowable. Specifically, claim 1 recites a surgical
instrument including a stem section extending from a handle
and a cutting tool. The cutting tool includes a rotatable
cutter. A hollow articulated section is connected with the
cutting tool and the stem section. A rotatable drive shaft is
connected with the cutter and is disposed in and extends
axially through the stem section and the articulated section.
The drive shaft has a flexible portion disposed in the

articulated section. An actuator means is connected with the handle for bending the articulated section and the flexible portion of the drive shaft to change the orientation of the cutter relative to tissue from a first orientation to a second orientation. The actuator means includes first and second elongated elements which extend through the stem section and articulated section and are connected with the cutting tool. The elongated elements are disposed between an outer side surface of the flexible portion of the drive shaft and an inner side of the articulated section. The actuator means includes means for pulling one of the elongated elements to bend the articulated section and the flexible portion of the drive shaft to change the orientation of the cutter from the first orientation to the second orientation. The drive shaft is rotatable relative to the articulated section to rotate the cutter when the cutter is in the first orientation and when the cutter is in the second orientation. The surgical instrument further includes passage means extending axially through the drive shaft for conducting tissue from a location adjacent the cutter through the articulated section and the stem section toward the handle. None of the prior art discloses or suggests a surgical instrument as set forth in claim 1.

U.S. Patent No. 5,285,795 to Ryan et al. discloses a discectomy system 20 with a bendable probe 22 and a steerable cannula 24. The probe 22 includes a probe needle 28 extending from a probe body 26. The probe needle 28 has a tubular cutting member 40 with a central bore 48 that reciprocates in

an outer housing 52. The cutting member 40 is spaced from the inner cylindrical wall 54 of the housing 52 to define an annular passage 58 through which irrigation fluid flows from the body 26 to the cutting member 40. Tissue is aspirated through the central bore 48 of the cutting member 40. The housing 52 has a bendable tubular section 78 made of an elastic material. The cutting member 40 includes a bendable section 86 located adjacent the section 78 of the housing 52. The cannula 24 has a bendable section 102 and an end 104. Tethers 94 and 96 are secured to the end 104 and extend along the outside of the bendable section 102 and through passages 106 and 108 in a rigid body 98 of the cannula 24. The turning of knobs 110 and 112 on a handle 114 of the cannula 24 causes the tethers 94 and 96 to be pulled to bend the bendable section 102. The bendable portions of the probe and cannula could be comprised of tightly wound steel wires as shown in U.S. Patent Application Serial No. 07/625,832, filed Dec. 11, 1990 and entitled "Percutaneous Surgical System with Rotary Cutting Blade".

The cannula 24 is positioned in the body of a patient and steered and positioned relative to a herniated disc. After the cannula 24 is positioned, the probe 22 is inserted through the cannula to cut tissue. The probe 22 is then drawn out of the cannula 24 and the cannula is repositioned using the tethers 94 and 96. After the cannula 24 is repositioned, the probe 22 is reextended through the cannula to sever tissue, see column 2, line 54 to column 3, line 4.

The Ryan et al patent does not disclose a rotatable cutter and a rotatable drive shaft connected with the cutter and disposed in and extending axially through a stem section and an articulated section. The Ryan et al. patent states that the bendable portions of the probe 22 and cannula 24 could be comprised of tightly wound steel wires as shown in U.S. Patent Application Serial NO. 07/625,832 filed Dec. 11, 1990 and entitled "Percutaneous Surgical System with Rotary Cutting Blade". The Ryan et al. patent does not disclose or suggest how the surgical system with the rotary cutting blade is constructed. Accordingly, the Ryan et al. patent does not disclose or suggest replacing the reciprocating cutter 40 and the bendable section 86 of the cutter with a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. Furthermore, the Ryan et al. patent does not disclose or suggest elongated elements disposed between an outer side surface of a flexible portion of a drive shaft and an inner side of an articulated section. The Ryan et al. patent discloses tethers 94 and 96 provided on the outside of a bendable section 102 of a steerable cannula 24, see Figs. 4 and 5. Accordingly, the tethers 94 and 96 are not disposed between an outer side surface of the bendable section 86 of the cutter 40 and an inner surface of the bendable section 78 of the housing 52 or an inner surface of the bendable section 102 of the cannula 24. The Ryan et al. patent does not disclose or suggest an actuator means including means for pulling on one of elongated elements to bend an articulated

section and a flexible portion of a drive shaft. The Ryan et al. patent discloses a steerable cannula 24 and a probe 22. The cannula 24 is positioned in the body by pulling on tethers 94 and 96. After the cannula 24 is positioned, the probe 22 is inserted through the cannula. The probe 22 is removed from the cannula 24 to reposition the cannula. The probe 22 is reinserted into the cannula 24 after the cannula has been repositioned. Accordingly, the tethers 94 and 96 are not pulled on to bend the bendable section 86 of the cutter 40. Thus, claim 1 is allowable.

Claim 2 recites a surgical instrument including a rotatable cutter and a rotatable drive shaft connected with the cutter and disposed in and extending axially through a stem section and an articulated section. Elongated elements are disposed between an outer side surface of a flexible portion of the drive shaft and an inner side of the articulated section. An actuator means includes means for pulling on one of the elongated elements to bend the articulated section and a flexible portion of the drive shaft. The surgical instrument further includes passage means extending through the drive shaft for conducting irrigating fluid through the drive shaft from the handle to the cutter.

As discussed above, the Ryan et al. patent does not disclose or suggest a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. The Ryan et al. patent does not disclose or suggest elongated elements disposed between an outer side surface of a flexible portion of a drive shaft and

an inner side of an articulated section, as discussed above. Also, the Ryan et al. patent does not disclose or suggest an actuator means including means for pulling on one of elongated elements to bend an articulated section and a flexible portion of a drive shaft. As discussed above, the Ryan et al. patent discloses pulling on tethers 94 and 96 to bend a bendable section 102 of a cannula 24. Pulling on the tethers 94 and 96 does not bend the bendable section 86 of the cutter 40. The Ryan et al. patent does not disclose or suggest passage means extending through a drive shaft for conducting irrigating fluid through the drive shaft from a handle to a cutter. The Ryan et al. patent discloses an annular passage 58 on the outside of the cutter 40 for conducting irrigating fluid from the probe body 26 to the cutter 40. Therefore, claim 2 is allowable.

Claim 3 recites a surgical instrument including a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. An actuator means includes means connected with a handle for bending the articulated section and a flexible section of the drive shaft to change the orientation of the cutter. As discussed above, the Ryan et al. patent does not disclose or suggest a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. Furthermore, the Ryan et al. patent does not disclose or suggest an actuator means including means connected with a handle for bending an articulated section and a flexible section of a drive shaft to

change the orientation of a cutter. Therefore, claim 3 is also allowable.

Claim 4 recites a surgical instrument including a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. Elongated elements are disposed between an outer side surface of a flexible section of the drive shaft and an inner side of the articulated section. An actuator means includes means for pulling on a first elongated element to bend the articulated section and a flexible section of the drive shaft in a first direction. The Ryan et al. patent does not disclose or suggest a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. Furthermore, the Ryan et al. patent does not disclose or suggest elongated elements disposed between an outer side surface of a flexible section of a drive shaft and an inner side of an articulated section. Also, the Ryan et al. patent does not disclose or suggest an actuator means including means for pulling on a first elongated element to bend an articulated section and a flexible section of a drive shaft in a first direction, as discussed above. Therefore, claim 4 is also allowable.

Claim 5 recites a surgical instrument including a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section. An actuator means connected with a handle bends the articulated section and a flexible section of the drive shaft to change the orientation of the cutter. The surgical

instrument further includes passage means extending axially through the drive shaft for conducting irrigating fluid from the handle to the cutter. The Ryan et al. patent does not disclose or suggest a rotatable cutter and a rotatable drive shaft disposed in and extending axially through a stem section and an articulated section, as discussed above. Also, the Ryan et al. patent does not disclose or suggest an actuator means connected with a handle bending an articulated section and a flexible section of a drive shaft to change the orientation of a cutter. The Ryan et al. patent discloses knobs 110 and 112 for pulling tethers 94 and 96 to bend a cannula 24 when a probe 22 is not inserted in the cannula. Furthermore, the Ryan et al. patent does not disclose or suggest passage means extending axially through a drive shaft for conducting irrigating fluid from a handle to a cutter. The Ryan et al. patent discloses an annular passage 58 defined by an outer surface of a cutter 40 for conducting irrigating fluid from a handle to a cutter. Thus, claim 5 is allowable.

Claim 6 recites a surgical instrument having an actuator means including means for pulling on one of elongated elements to bend an articulated section and a flexible portion of a drive shaft to change the orientation of a movable member. The Ryan et al. patent does not disclose or suggest actuator means including means for pulling on one of elongated elements to bend an articulated section and a flexible portion of a drive shaft to change the orientation of a movable member.

The Ryan et al. patent discloses knobs 110 and 112 that pull on the tethers 94 and 96 to bend a cannula 24 when a probe 22

is not inserted in the cannula. Therefore, claim 6 is allowable.

Claim 7 recites a surgical instrument having an actuator means including means for pulling on one of elongated elements to bend an articulated section and a flexible portion of a drive shaft to change the orientation of a movable member. The surgical instrument further includes passage means extending through the drive shaft to conduct irrigating fluid through the drive shaft from the handle to the movable member. The Ryan et al. patent does not disclose or suggest an actuator means including means for pulling on one of elongated elements to bend an articulated section and a flexible portion of a drive shaft to change the orientation of a movable member, as discussed above. Furthermore, the Ryan et al. patent does not disclose or suggest passage means extending through a drive shaft to conduct irrigating fluid through the drive shaft from a handle to a movable member, as discussed above. Therefore, claim 7 is allowable.

Claim 10 recites a surgical instrument having an actuator means connected to a handle for bending an articulated section and a flexible portion of means for moving a portion of a movable member to change the orientation of the movable member. The Ryan et al. patent does not disclose or suggest an actuator means connected to a handle for bending an articulated section and a flexible portion of means for moving a portion of a movable member to change the orientation of the movable member. The Ryan et al. patent discloses knobs 110 and 112 that bend a steerable cannula 24 when the probe 22 is

not inserted in the cannula. Accordingly, the knobs 110 and 112 do not bend the bendable section 86 of the cutter 40. Therefore, claim 10 is allowable.

Claim 11 recites a surgical instrument having an actuator means connected to a handle for bending an articulated section and a flexible portion of means for moving a portion of a movable member to change the orientation of the movable member. The surgical instrument further includes passage means for conducting irrigating fluid from a handle to the movable member. The passage means extends axially from the handle through the articulated section and a stem section to the movable member. The passage means extends through the means for moving the portion of the movable member. The Ryan et al. patent does not disclose or suggest actuator means connected to a handle for bending an articulated section and a flexible portion of means for moving a portion of a movable member to change the orientation of the movable member. The Ryan et al. patent discloses knobs 110 and 112 that bend a steerable cannula 24 when the probe 22 is not inserted in the cannula. Accordingly, the knobs 110 and 112 do not bend the bendable section 86 of the cutter 40. Also, the Ryan et al. patent does not disclose or suggest passage means for conducting irrigating fluid from a handle to a movable member extending axially from a handle through an articulated section and a stem section to a movable member and through means for moving a portion of the movable member. The Ryan et al. patent discloses an annular passage 58 defined by an outer surface of the bendable section 86 of the cutter 40 for

conducting irrigating fluid to the cutter 40. Therefore,
claim 11 is allowable.

In view of the foregoing, it is respectfully submitted
that the above-identified application is in condition for
allowance, and allowance of the above-identified application
is respectfully requested.

Please charge any deficiency or credit any overpayment in
the fees for this amendment to our Deposit Account
No. 20-0090.

Respectfully submitted,


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